

Acoustic Resonator and Method for Making the SameABSTRACT

5        An acoustical resonator and a method for making the same. A resonator according to the present invention includes a layer of piezoelectric material sandwiched between first and second electrodes. The first electrode includes a conducting sheet having a RMS variation in height of less than  $2\mu\text{m}$ . The resonator bridges a cavity in a substrate on which the resonator is constructed. The resonator is constructed by creating a cavity in the substrate and filling  
10    the same with a sacrificial material that can be rapidly removed from the cavity after the deposition of the various layers making up the resonator. The surface of the filled cavity is polished to provide a RMS variation in height of less than  $0.5\mu\text{m}$ . The first electrode is deposited on the polished surface to a thickness that assures that the RMS variation in height of the metallic layer is less than  $2\mu\text{m}$ . The piezoelectric layer is deposited on the first  
15    electrode and the second electrode is then deposited on the piezoelectric layer. The sacrificial material is then removed from the cavity by opening vias into the cavity and removing the material through the vias. The preferred sacrificial material is phosphor-silica-glass.

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